# Assignment 2 - Practicing Java

**Problem 1.** What will be printed to the console when the following Java file is compiled and run?

```
public class Problem1 {
    public static void main(String[] args) {
        for (int i = 10; i > 5; i--) {
            int a = i / 3;
            if (a % 2 == 0) {
                System.out.println("no cap");
            } else {
                System.out.println("bruh");
            }
        }
    }
}
```

Explain your answer by evaluating variables at each loop iteration

**Solution.** The output of this code will be:

```
bruh
bruh
no cap
no cap
no cap
```

At the start of the loop, $i = 10$ and thus $a = 3$ since $10/3$ rounds down to 3. 3 is odd so it prints `bruh`. At the end of the iteration $i$ is *decremented* to 9. Again, $a = i/3 = 3$ and so it prints `bruh` and then $i$ is decremented to 8. For the next three iterations, $i/3$ rounds down to 2, and thus `no cap` is printed. Once $i$ is decremented to 5 the loop stops.

**Problem 2.** Write a public static Java method that takes in 3 integers and returns the minimum using `Math.min(int a, int b)`

**Solution.**

```
public static int minOfThree(int a, int b, int c) {
    int min = Math.min(a, b);
    min = Math.min(min, c);
    return min;
}
```

**Problem 3.** For a non-negative integer $n$, $n!$ (read as n factorial) is equal to $n \times (n-1) \times (n-2) \times \ldots 2 \times 1$. For example, $4! = 4 \times 3 \times 2 \times 1$. We also define 0! to be 1. Create a Factorial program that takes $n$ as a command line argument and prints the value of $n!$. The class should have it's own public static factorial(int n) method. Handle any exceptions that might be thrown.

**Solution.**

```
public class Factorial {
    public static void main(String[] args) {
        try {
            int n = Integer.parseInt(args[0]);
            System.out.println(factorial(n));
        } catch (Exception e) {
            System.out.print("Please input a non-negative integer");
        }
    }

    public static int factorial(int n) {
        if (n < 0) {
            throw new IllegalArgumentException("Factorial is not defined for integers less than 0");
        } else {
            int output = 1;
            for (int i = 1; i <= n; i++) {
                output = output * i;
            }
            return output;
        }
    }
}
```